

1 **WHAT IS CLAIMED IS:**

2 1. A system for manufacturing a membrane electrode assembly  
3 for a fuel cell comprising:

4 a catalyst solution preheating device preheating a cathode catalyst  
5 solution and an anode catalyst solution;

6 an carrying gas preheater preheating an carrying gas;

7 a cathode catalyst solution spray nozzle supplied with the cathode  
8 catalyst solution preheated by the catalyst solution preheating device and the  
9 carrying gas preheated by the carrying gas preheater and configured to spray  
10 the supplied cathode catalyst solution; and

11 an anode catalyst solution spray nozzle supplied with the anode  
12 catalyst solution preheated by the catalyst solution preheating device and the  
13 carrying gas preheated by the carrying gas preheater and configured to spray  
14 the supplied anode catalyst solution.

15 2. The system of claim 1, wherein the catalyst solution  
16 preheating device heats the cathode catalyst solution and the anode catalyst  
17 solution at a temperature in a range of  $0.6 \cdot BP$  to  $0.95 \cdot BP$ , where BP is a  
18 boiling point of a solvent of the catalyst solution.

19 3. The system of claim 1, wherein the catalyst solution  
20 preheating device comprises:

21 a cathode catalyst solution preheater preheating the cathode catalyst  
22 solution; and

23 an anode catalyst solution preheater preheating the anode catalyst  
24 solution.

1           4.       The system of claim 3, wherein the cathode catalyst solution  
2 preheater heats the cathode catalyst solution at a temperature in a range of  
3  $0.6*BP$  to  $0.95*BP$ , where BP is a boiling point of a solvent of the catalyst  
4 solution.

5           5.       The system of claim 3, wherein the anode catalyst solution  
6 preheater heats the anode catalyst solution at a temperature in a range of  
7  $0.6*BP$  to  $0.95*BP$ , where BP is a boiling point of a solvent of the catalyst  
8 solution.

9           6.       The system of claim 1, wherein the cathode and anode  
10 catalyst solution spray nozzles operate to alternately spray the catalyst  
11 solution.

12          7.       The system of claim 1, wherein the carrying gas preheater  
13 heats the carrying gas at a temperature higher than the boiling points of the  
14 cathode catalyst solution and the anode catalyst solution.

15          8.       The system of claim 1, wherein the carrying gas is one of  
16 argon, helium, nitrogen, and air.

17          9.       A method for manufacturing a membrane electrode assembly  
18 for a fuel cell comprising:

19           preheating a cathode catalyst solution;

20           preheating an anode catalyst solution;

21           preheating an carrying gas;

22           spraying the preheated cathode catalyst solution through a cathode  
23 catalyst solution spray nozzle using the preheated carrying gas; and

24           spraying the preheated anode catalyst solution through an anode

1 catalyst solution spray nozzle using the preheated carrying gas.

2 10. The method of claim 9, wherein the spraying of the preheated  
3 cathode catalyst solution and the spraying of the preheated anode catalyst  
4 solution are alternately performed.

5 11. The method of claim 9, wherein in the preheating of the  
6 cathode catalyst solution, the cathode catalyst solution is heated at a  
7 temperature in a range of  $0.6 \times BP$  to  $0.95 \times BP$ , where BP is a boiling point of a  
8 solvent of the catalyst solution.

9 12. The method of claim 9, wherein in the preheating of the anode  
10 catalyst solution, the anode catalyst solution is heated at a temperature in a  
11 range of  $0.6 \times BP$  to  $0.95 \times BP$ , where BP is a boiling point of a solvent of the  
12 catalyst solution.

13 13. The method of claim 9, wherein in the preheating of the  
14 carrying gas, the carrying gas is heated at a temperature higher than the  
15 boiling points of the cathode catalyst solution and the anode catalyst solution.

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